

Docket No.: 264451US0PCT

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

IN RE APPLICATION OF:  
Hans LICHTENSTEIN, et al.

GROUP: 1755

SERIAL NO: 10/521,769

EXAMINER: KOSLOW

FILED: January 19, 2005

FOR: MOULDING COMPOSED OF PLASTIC, COMPRISING A FLUORESCENT  
DYE

**DECLARATION UNDER 37 C.F.R. § 1.132**

COMMISSIONER FOR PATENTS  
ALEXANDRIA, VIRGINIA 22313

Sir:

Now comes Mr. Hans Lichtenstein who deposes and states that:

1. I am a graduate of chemistry and received my diploma degree in the year 1979.

2. I have been employed by Evonik Roehm GmBH for 28 years as a scientist in the field of semi-finished products, special light engineering

3. The following experiments were carried out by me or under my direct supervision and control.

4. New Examples were prepared according to the procedures described at page 6 of the specification of the present invention.

**The examples according to the present invention are accented in bold letters.**

Comparative examples are shown in regular (not bold) font.

**Tables 1, 2 and 3** show the amounts of the components used in the respective examples and Comparative examples.

**Tables 4, 5 and 6** show the test results for Hue, L\*, a\*, b\*, Luminosity coefficient and Visual evaluation in D65 daylight.

**The values should be compared only within one set of coloring.** The comparison should be made within the following sets which are listed in order in the Tables.

**Table 1 and 4:**

- 113T (comparative) and 144M (according to invention);
- 113Q (comparative) and 144K (according to invention);
- 113S (comparative) and 144G (according to invention);
- 148A (comparative) and 148F (according to invention);
- 780/I/1 (comparative), 780/I/2 (according to invention), 780/I/3 (according to invention), 780/I/4 (comparative);
- 780/I/5 (comparative), 780/I/6 (according to invention), 780/I/7 (according to invention), 780/I/8 (comparative);
- 780/I/9 (comparative), 780/I/10 (according to invention), 780/I/11 (according to invention), 780/I/12 (comparative);
- 780/I/13 (comparative), 780/I/14 (according to invention), 780/I/15 (according to invention), 780/I/16 (comparative).

**Tables 2 and 5:**

- 780/II/1 (according to invention) and 780/II/5 (comparative);
- 780/II/2 (according to invention) and 780/II/6 (comparative);
- 780/II/3 (according to invention) and 780/II/7 (comparative);
- 780/II/4 (according to invention) and 780/II/8 (comparative).

**Tables 3 and 6:**

- 780/III/1 (according to invention) and 780/III/5 (comparative);
- 780/III/2 (according to invention) and 780/III/6 (comparative);
- 780/III/3 (according to invention) and 780/III/7 (comparative);
- 780/III/4 (according to invention) and 780/III/8 (comparative).

**Table 1**

Test No.	White pigment, titanium dioxide %	Scattering agent, barium sulfate %	Lumogen F Orange 240 %	Lumogen F Yellow 083 %	Lumogen F Red 305 %	Hostasol yellow 3G %
113T	----	1.0	0.05			
144M	0.0075	1.0	0.05			
113Q	----	1.0		0.05		
144K	0.0075	1.0		0.05		
113S	----	1.0			0.05	
144G	0.0075	1.0			0.05	
148A	----	1.0				0.05
148F	0.0075	1.0				0.05
780/I/1	0.0005	1.0	0.05			
780/I/2	0.0015	1.0	0.05			
780/I/3	0.075	1.0	0.05			
780/I/4	0.15	1.0	0.05			
780/I/5	0.0005	1.0		0.05		
780/I/6	0.0015	1.0		0.05		
780/I/7	0.075	1.0		0.05		
780/I/8	0.15	1.0		0.05		
780/I/9	0.0005	1.0			0.05	
780/I/10	0.0015	1.0			0.05	
780/I/11	0.075	1.0			0.05	
780/I/12	0.15	1.0			0.05	
780/I/13	0.0005	1.0				0.05
780/I/14	0.0015	1.0				0.05
780/I/15	0.075	1.0				0.05
780/I/16	0.15	1.0				0.05

**Table 2**

Test No.	White pigment, titanium dioxide %	Scattering agent, SBX8* %	Lumogen F Orange 240 %	Lumogen F Yellow 083 %	Lumogen F Red 305 %	Hostasol yellow 3G %
780/II/1	0.0075	1.0	0.05			
780/II/2	0.0075	1.0		0.05		
780/II/3	0.0075	1.0			0.05	
780/II/4	0.0075	1.0				0.05
780/II/5		1.0	0.05			
780/II/6		1.0		0.05		
780/II/7		1.0			0.05	
780/II/8		1.0				0.05

\*Techpolymer SBX8 of Sekisui, Japan (cross-linked polystyrene)

**Table 3**

Test No.	White pigment, titanium dioxide %	Scattering agent, polystyrene %	Lumogen F Orange 240 %	Lumogen F Yellow 083 %	Lumogen F Red 305 %	Hostasol yellow 3G %
780/III/1	0.0075	1.0	0.05			
780/III/2	0.0075	1.0		0.05		
780/III/3	0.0075	1.0			0.05	
780/III/4	0.0075	1.0				0.05
780/III/5		1.0	0.05			
780/III/6		1.0		0.05		
780/III/7		1.0			0.05	
780/III/8		1.0				0.05

White pigment	Scattering agent	Refractive index*
Titanium dioxide		2.70
	Barium sulfate	1.64
	SBX8	1.59
	Polystyrene	1.58

\* from literature and manufacturers' data

Refractive index of the PMMA matrix = 1.5

Table 4

**TiO<sub>2</sub> as white pigment and BaSO<sub>4</sub> as scattering agent**

Test No.	Hue	L*	a*	b*	Luminosity coefficient in %	Visual evaluation in D65 daylight
113T	Orange	57.67	18.84	58.39	25.6	orange-yellow fluorescing, somewhat cloudy
144M	Orange	66.32	25.02	71.06	35.74	orange-yellow fluorescing, very brilliant
113Q	Yellow	63.07	-27.02	58.38	31.67	yellow fluorescing, somewhat cloudy
144K	Yellow	70.66	-27.17	69.43	41.69	yellow fluorescing, very brilliant
113S	Red	40.66	47.18	29.89	11.65	red fluorescing, somewhat cloudy
144G	Red	42.68	51.78	31.00	12.95	red fluorescing, very brilliant
148A	Yellow	63.78	-25.19	62.60	32.53	yellow fluorescing, somewhat cloudy
148F	Yellow	71.19	-24.83	73.80	42.46	yellow fluorescing, very brilliant
780/I/1	Orange	63.97	18.19	68.98	32.77	orange-yellow fluorescing, somewhat cloudy
780/I/2	Orange	66.65	22.12	72.21	36.17	orange-yellow fluorescing, brilliant
780/I/3	Orange	81.88	33.42	85.14	60.08	orange-yellow fluorescing, pale and brilliant
780/I/4	Orange	86.01	34.81	86.86	68.01	orange-yellow fluorescing, very pale, not very brilliant
780/I/5	Yellow	67.00	-24.60	65.90	36.63	yellow fluorescing, somewhat cloudy
780/I/6	Yellow	69.38	-25.09	70.14	39.88	yellow fluorescing, brilliant
780/I/7	Yellow	93.19	-26.04	104.07	83.41	yellow fluorescing, pale and brilliant
780/I/8	Yellow	97.21	-25.48	108.88	92.95	yellow fluorescing, very pale, not very brilliant
780/I/9	Red	45.27	49.12	39.22	14.73	red fluorescing, somewhat cloudy
780/I/10	Red	45.81	49.49	38.68	15.13	red fluorescing, brilliant
780/I/11	Red	57.49	64.60	41.16	25.43	red fluorescing, pale and brilliant
780/I/12	Red	61.66	67.94	40.08	30.01	red fluorescing, very pale, not very brilliant
780/I/13	Yellow	68.55	-25.17	72.54	38.72	yellow fluorescing, somewhat cloudy
780/I/14	Yellow	70.12	-25.58	75.30	40.91	yellow fluorescing,

						<b>brilliant</b>
<b>780/I/15</b>	<b>Yellow</b>	<b>95.38</b>	<b>-26.10</b>	<b>106.93</b>	<b>88.52</b>	<b>yellow fluorescing, pale and brilliant</b>
<b>780/I/16</b>	<b>Yellow</b>	<b>99.37</b>	<b>-25.31</b>	<b>108.38</b>	<b>98.37</b>	<b>yellow fluorescing, very pale, not very brilliant</b>

**Table 5****TiO<sub>2</sub> as white pigment and SBX8 beads as scattering agent**

<b>Test No.</b>	<b>Hue</b>	<b>L*</b>	<b>a*</b>	<b>b*</b>	<b>Luminosity coefficient in %</b>	<b>Visual evaluation in D65 daylight</b>
<b>780/II/1</b>	<b>Orange</b>	<b>68.46</b>	<b>22.57</b>	<b>73.88</b>	<b>38.60</b>	<b>orange-yellow fluorescing, very brilliant</b>
<b>780/II/2</b>	<b>Yellow</b>	<b>75.62</b>	<b>-26.17</b>	<b>79.67</b>	<b>49.27</b>	<b>yellow fluorescing, very brilliant</b>
<b>780/II/3</b>	<b>Red</b>	<b>49.04</b>	<b>54.99</b>	<b>41.13</b>	<b>17.63</b>	<b>red fluorescing, very brilliant</b>
<b>780/II/4</b>	<b>Yellow</b>	<b>83.72</b>	<b>-27.56</b>	<b>95.57</b>	<b>63.54</b>	<b>yellow fluorescing, very brilliant</b>
<b>780/II/5</b>	<b>Orange</b>	<b>63.52</b>	<b>16.57</b>	<b>68.21</b>	<b>32.22</b>	<b>orange-yellow fluorescing, somewhat cloudy</b>
<b>780/II/6</b>	<b>Yellow</b>	<b>69.02</b>	<b>-25.67</b>	<b>69.33</b>	<b>39.37</b>	<b>yellow fluorescing, somewhat cloudy</b>
<b>780/II/7</b>	<b>Red</b>	<b>45.27</b>	<b>48.55</b>	<b>38.37</b>	<b>14.73</b>	<b>red fluorescing, somewhat cloudy</b>
<b>780/II/8</b>	<b>Yellow</b>	<b>69.35</b>	<b>-26.82</b>	<b>73.00</b>	<b>39.83</b>	<b>yellow fluorescing, somewhat cloudy</b>

**Table 6****TiO<sub>2</sub> as white pigment and polystyrene as scattering agent**

<b>Test No. (poly-styrene)</b>	<b>Hue</b>	<b>L*</b>	<b>a*</b>	<b>b*</b>	<b>Luminosity coefficient in %</b>	<b>Visual evaluation in D65 daylight</b>
<b>780/III/1</b>	<b>Orange</b>	<b>61.84</b>	<b>15.37</b>	<b>63.75</b>	<b>30.22</b>	<b>orange-yellow fluorescing, very brilliant</b>
<b>780/III/2</b>	<b>Yellow</b>	<b>68.14</b>	<b>-25.72</b>	<b>67.35</b>	<b>38.16</b>	<b>yellow fluorescing, very brilliant</b>
<b>780/III/3</b>	<b>Red</b>	<b>46.26</b>	<b>49.91</b>	<b>37.77</b>	<b>15.46</b>	<b>red fluorescing, very brilliant</b>
<b>780/III/4</b>	<b>Yellow</b>	<b>68.49</b>	<b>-26.95</b>	<b>71.44</b>	<b>38.65</b>	<b>yellow fluorescing, very brilliant</b>
<b>780/III/5</b>	<b>Orange</b>	<b>52.77</b>	<b>-2.26</b>	<b>51.01</b>	<b>20.84</b>	<b>orange-yellow fluorescing, somewhat cloudy</b>
<b>780/III/6</b>	<b>Yellow</b>	<b>50.62</b>	<b>-22.43</b>	<b>39.85</b>	<b>18.95</b>	<b>yellow fluorescing, somewhat cloudy</b>
<b>780/III/7</b>	<b>Red</b>	<b>41.95</b>	<b>41.86</b>	<b>33.48</b>	<b>12.47</b>	<b>red fluorescing, somewhat</b>

						cloudy
780/III/8	Yellow	51.77	-21.92	44.60	19.94	yellow fluorescing, somewhat cloudy

5. The new examples show that superior properties are obtained when the whitening pigment is used in the claimed amount of 0.001 to 0.1 % by weight.

Below 0.001 % by weight (for example at 0.0005 % by weight) the coloring is too dim. Above the upper limit of 0.1 % by weight (for example at 0.15 % by weight) the coloring is too bright (high L values) which takes away the brilliance.

Close to the upper and lower limits ( for example at 0.0015 and 0.075 %) as well as almost in the middle of the range (0.0075 %) good results are detected throughout.

Beyond the values themselves, the optical evaluation with the human eye under day light conditions (D65) is also important.

Examples with SBX8 light scattering pearls made of cross linked polystyrene and with (not cross linked) polystyrene are presented in addition to BaSO<sub>4</sub> as light scattering agent.

Notably, as seen in Tables 4, 5 and 6, the examples according to the present invention (**shown in bold**) exhibit superior L\*, a\*, and b\* values, Luminosity coefficient and Visual evaluation in D65 daylight compared to the respective comparative examples.

Applicants know of no reason why other examples within the scope of Claim 1 of the present invention should not show the same superior results.

6. The undersigned petitioner declares further that all statements made herein of his own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of this application or any patent issuing thereon.

7. Further deponent saith not.

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22850

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Signature

*Ham Lilliet*

Date

*January 14, 2008*